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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,287	07/23/2001	Peter P. Van Bemmel	94.0037	2849
7590	02/28/2005		EXAMINER	
Schlumberger Geoquest Suite 1700 5599 San Felipe Houston, TX 77056-2722			STEVENS, THOMAS H	
			ART UNIT	PAPER NUMBER
			2123	

DATE MAILED: 02/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/911,287	VAN BEMMEL ET AL.
	Examiner	Art Unit
	Thomas H. Stevens	2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 23 July 2001.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-18 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-18 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 23 July 2001 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
     Paper No(s)/Mail Date 7/23/01.

4) Interview Summary (PTO-413)  
     Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

1. Claims 1-18 were examined.

### ***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-18 are rejected under 35 U.S.C. 101 because they recite mathematical problem solving or a manipulation of abstract ideas.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-18 are rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either an asserted utility or a well established utility for the reasons set forth above.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claims 1 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "taking a step" is unclear or the sentence is incomplete.

***Claim Rejections - 35 USC § 103***

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being anticipated by Marcoote (Fast Variogram Computation with FFT (Computers-Geosciences (1996)). Marcoote teaches two programs for computer direct and cross-variograms, direct and cross-covariograms and pseudo-cross-variograms which use fast Fourier transforms (FFT algorithm) via MATLAB® but doesn't teach semi-variograms. Zwahlen et al., ("A Comparison of Mapping Schemes for Reservoir Characterization" (1997)) teaches illustrating semi-variograms of geological data via MATLAB®. It would have been obvious, at the time of invention, to one of ordinary skill in the art to modify Zwahlen et al., with Marcoote since the software's mesh algorithm assists in deleting outliers.

Claim 1. A method of generating a Semi-variogram (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully), comprising the steps of:

- (a) receiving spatial data in a space domain (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph)
- (b) taking a Fourier Transform (Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph) of said spatial data, (Zwahlen: pg. 2, problem statement section) and
- (c) generating a Semi-variogram (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully) in response to the taking step (not addressed: unclear)

Claim 2. The method of claim 1, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph)

wherein, following the taking step, a frequency domain

Representation (Marcotte: pg. 1176, equation 3) of the spatial data (Zwahlen: pg. 2, problem statement section) is generated including a DC component or mean of the spatial data, and wherein the generating step (c) comprises the step of: (c1) removing said DC component thereby generating a frequency domain representation of the spatial data with zero mean (FFT) (Marcotte: pg. 1176, right column, paragraphs 3-5).

Claim 3. The method of claim 2, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs

5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph;

Marcotte: pg. 1176, right column, paragraphs 3-5) wherein the generating step (c)

further comprises the step of (Marcotte: pg. 1176, right column, paragraphs 3-5): (c2)

computing a complex conjugate of said FFT thereby producing FFT\* (Marcotte: pg.

1176, left column).

Claim 4. The method of claim 3, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs

5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph;

Marcotte: pg. 1176, right column, paragraphs 3-5); wherein the generating step (c)

further comprises the step of (Marcotte: pg. 1176, right column, paragraphs 3-5): (c3)

complex multiplying said FFT and said FFT\* thereby producing a complex product

(Marcotte: pg. 1176, right column, below equation 5).

Claim 5. The method of claim 4, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph; Marcotte: pg. 1176, right column, paragraphs 3-5)wherein the generating step (c) further comprises the step of (Marcotte: pg. 1176, right column, paragraphs 3-5): (c4) taking an inverse Fourier Transform (Marcotte: pg. 1177, equation 6) of said complex product thereby generating a space domain representation of the complex product (IFFT).

Claim 6. The method of claim 5, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph; Marcotte: pg. 1176, right column, paragraphs 3-5) wherein the generating step (c) further comprises the step of (Marcotte: pg. 1176, right column, paragraphs 3-5): (c5) subtracting said IFFT from a zero lag covariance thereby generating said Semi-variogram (Marcotte: pg. 1177, left column).

Claim 7. A program storage device (Inherent relative to the software and magnitude of the simulation: Zwahlen: pg. 3, paragraph 4) adapted for storing instructions, said instructions (Zwahlen: pg.2, right column, last paragraph) adapted to be executed by a processor, said instructions when executed by said processor conducting a method comprising the steps of:

(a) Receiving spatial data in a space domain (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph)

(b) taking a Fourier Transform (Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph) of said spatial data(Zwahlen: pg. 2, problem statement section), and

(c) generating a Semi-variogram (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully) in response to the taking step (not addressed: unclear)

Claim 8. The program storage device of claim 7, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph; Marcotte: pg. 1176, right column, paragraphs 3-5) wherein, following the taking step (Marcotte: pg. 1176, right column, paragraphs 3-5), a frequency domain representation of the spatial data is generated including a DC component or mean of the spatial data, and wherein the generating step (c) comprises the step of: (c1) removing said DC component thereby generating a frequency domain representation of the spatial data with zero mean (FFT) (Marcotte: pg. 1176, right column, paragraphs 3-5).

Claim 9. The program storage device of claim 8, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph) wherein the generating step (c) further comprises the step of: (c2) computing a complex conjugate of said FFT thereby producing FFT\* (Marcotte: pg. 1176, left column).

Claim 10. The program storage device of claim 9, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph; Marcotte: pg. 1176, left column) wherein the generating step (c) further comprises the step of (Marcotte: pg. 1176, right column, paragraphs 3-5): (c3) complex multiplying said FFT and said FFT: thereby producing a complex product (Marcotte: pg. 1177, equation 6).

Claim 11. The program storage device of claim 10, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph; Marcotte: pg. 1176, left column) wherein the generating step (c) further comprises the step of (Marcotte: pg. 1176, right column, paragraphs 3-5): (c4) taking an inverse Fourier Transform (Marcotte: pg. 1177, equation 7) of said complex product thereby generating a space domain representation of the complex product (IFFT).

Claim 12. The program storage device of claim 11, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph; Marcotte: pg. 1176, left column) wherein the generating step (c) further comprises the step of (Marcotte: pg. 1176, right column, paragraphs 3-5) (c5) subtracting said IFFT from a zero lag covariance (Marcotte: left column) thereby generating said Semi-variogram.

Claim 13. An apparatus responsive to a set of spatial data (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph) in a space domain adapted for generating a Semi-variogram, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully) comprising: first means for receiving said spatial data in a space domain (Zwahlen: pg. 2, problem statement section); second means for taking a Fourier Transform (Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph) of said spatial data, and third means for generating a Semi-variogram (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully) in response to said taking of said Fourier Transform (Zwahlen: pg.1176, left column) of said spatial data by said second means.

Claim 14. The apparatus of claim 13, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph; 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph) wherein said second means takes said Fourier Transform (Zwahlen: pg.1176, left column) of said spatial data (Zwahlen: pg. 2, problem statement section) and, responsive thereto, generates a frequency domain representation of said spatial data including a DC component or mean of said spatial data, and wherein said third means comprises: means for removing said DC component thereby generating a frequency domain representation of the spatial data with zero mean (FFT) (Marcotte: pg. 1176, right column, paragraphs 3-5).

Claim 15. The apparatus of claim 14, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph; 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction,

3<sup>rd</sup> paragraph) wherein said third means further comprises: means for computing a complex conjugate of said FFT thereby producing FFT\* (Marcotte: pg. 1176, right column, paragraphs 3-5).

Claim 16. The apparatus of claim 15, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph; 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph) wherein said third means further comprises: means for complex multiplying said FFT and said FFT: thereby producing a complex product (Marcotte: pg. 1177).

Claim 17. The apparatus of claim 16, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph; 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph) wherein said third means further comprises: means for taking an inverse Fourier Transform of said complex product thereby generating a space domain representation of the complex product (IFFT) (Marcotte: pg. 1177).

Claim 18. The apparatus of claim 17, (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph; 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully; Marcotte: pg. 1, Introduction, 3<sup>rd</sup> paragraph) wherein said third means further comprises: means for subtracting said IFFT from a zero lag covariance(Marcotte: pg. 1177). thereby generating said Semi-variogram (Zwahlen: pg. 1, Geostatistics, 2<sup>nd</sup> paragraph with pgs 5 and 7 figures 7 and 11, respectfully).

***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715, Monday-Friday (8:00 am- 4:30 pm) or contact Supervisor Mr. Kevin Teska at (571) 272-3716. Fax number is 571-273-3715.

Any inquires of general nature or relating to the status of this application should be directed to the Group receptionist whose phone number is (571)272-1400.

February 17, 2005

THS



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